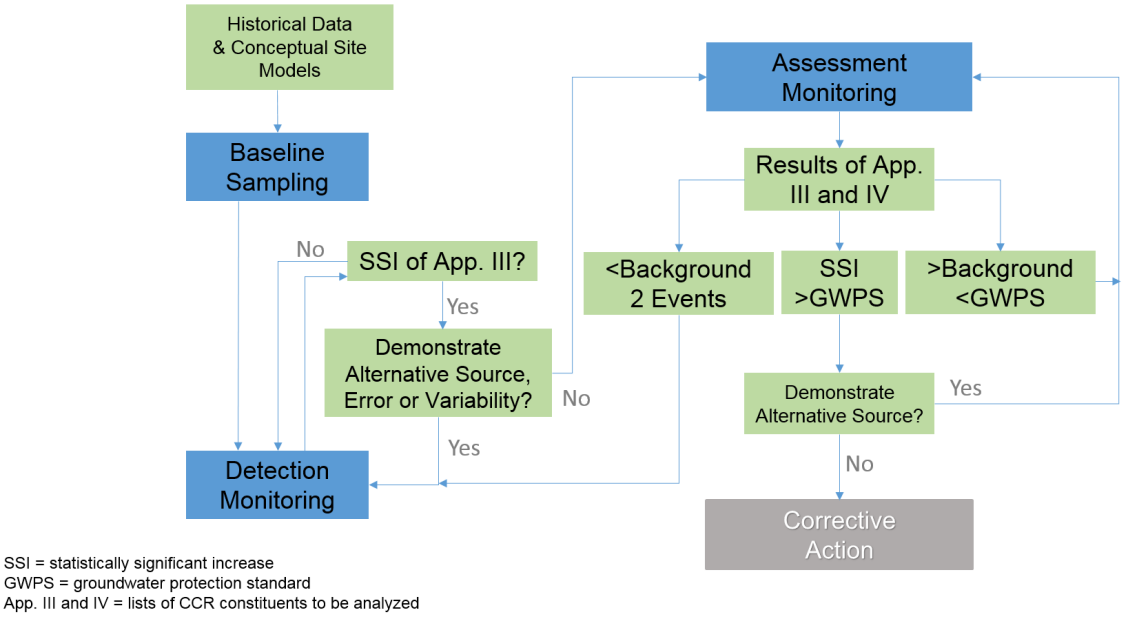
Executive Summary
CCR Rule Groundwater Monitoring Requirements

The U.S. Environmental Protection Agency (USEPA) published the Coal Combustion Residuals (CCR) Rule [40 CFR 257, Subpart D] on April 17, 2015. This Rule requires groundwater monitoring of active, inactive and new CCR impoundments and active and new CCR landfills. The CCR Rule establishes multiple phases of protective groundwater monitoring, including baseline sampling, Detection Monitoring and Assessment Monitoring. Corrective action may be necessary at the completion of this process.

CCR Groundwater Monitoring Phases



SSI = statistically significant increase
GWPS = groundwater protection standard
App. III and IV = lists of CCR constituents to be analyzed

Baseline Sampling

To comply with the CCR Rule, a network of groundwater monitoring wells must be installed at strategic locations around each CCR unit. Based on groundwater flow direction, both upgradient and downgradient wells must be installed. The wells enable collection of representative groundwater samples from the uppermost aquifer. This aquifer is defined as the groundwater source nearest the surface that can produce usable groundwater for wells or springs. The number of wells and sampling frequency may vary by site.

Detection Monitoring Program

At a minimum, samples are tested for seven different constituents that are considered by USEPA to be the "leading indicators" of whether contamination is migrating from a CCR unit. These are found in **40 CFR Part 257, Appendix III, Constituents for Detection Monitoring** and are as follows:

- boron (B)
- calcium (Ca)
- chloride (Cl)
- fluoride (F)

- pH
- sulfates (SO_x)
- total dissolved solids (TDS)

The groundwater results are evaluated using a defined statistical method to determine whether there were Statistically Significant Increases (SSIs) above the natural, or background, concentrations for each constituent in every downgradient well.

- If SSIs are discovered, the data is further evaluated through an Alternative Source Demonstration (ASD) to verify whether there is an alternative source, an error in the sampling or analytical method, or natural variability in groundwater quality.

- If SSIs remain, the facility shifts into an Assessment Monitoring Program within 90 days (see Assessment Monitoring Program discussion below).

- If no SSIs were found, or if they do not remain after evaluation, the CCR facility continues with a Detection Monitoring Program.

Detection Monitoring continues through the operating life of the CCR unit and through the prescribed post-closure period. Groundwater samples are collected twice a year and are tested for the same Appendix III constituents that are used in the baseline sampling. The results are evaluated the same way for SSIs as described above. If no SSIs are noted, the Monitoring Program continues on in its normal fashion. If an SSI is identified and remains after evaluation at any point in the program, the facility must shift into Assessment Monitoring within 90 days.

Assessment Monitoring Program

When Assessment Monitoring is triggered, the groundwater sampling is expanded to test for additional constituents. These constituents, which are almost all metals, are listed in **40 CFR Part 257, Appendix IV, Constituents for Assessment Monitoring**:

- antimony (Sb)
- arsenic (As)
- barium (Ba)
- beryllium (Be)
- cadmium (Cd)
- chromium (Cr)
- cobalt (Co)
- fluoride (F)
- lead (Pb)
- lithium (Li)
- mercury (Hg)
- molybdenum (Mo)
- selenium (Se)
- thallium (Tl)
- radium 226/228 combined (Ra)

During Assessment Monitoring, downgradient concentrations will be evaluated for Statistically Significant Levels (SSLs) as compared to the Groundwater Protection Standards (GWPS) created for the site. Once a facility enters the Assessment Monitoring Program, there are several possible outcomes:

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- If the constituents are at or below the background levels (or if the background levels are naturally high as noted on the GWPS) for two consecutive sample events, then the program returns to the Detection Monitoring level of the program

- If any of the Appendix III or IV constituents are above background concentrations, but are below all of the GWPS, then the CCR unit remains in the Assessment Monitoring Program.

- If there is a SSL occurrence, an Alternative Source Demonstration (ASD) justification can be made within 90 days that another source unrelated to the CCR unit was the cause of the SSL occurrence, or that the SSL occurrence was a result of a sampling and analysis error, a statistical evaluation error or a natural groundwater quality variation. A CCR unit can continue under the Assessment Monitoring Program if a successful ASD justification explaining the SSL occurrence is made.

- If there is a sampling result that cannot be attributed to an alternative source (including sampling error, natural increase in background levels, etc., as described above), an assessment of Corrective Measures must begin within 90 days or immediately upon determination of a release from a CCR unit. These measures, which are opened for public comment, must include a schedule of how quickly they will be put in place and how long they will remain. The measures must begin within 90 days of approval.

Each facility is also responsible for preparing a Groundwater Monitoring and Corrective Action Report by January 31 every year and posting it to a public internet site within 30 days of placement in the operating record.